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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,490	10/04/2006	Anders Johansson	1501-1326	2304

466 7590 10/06/2010  
YOUNG & THOMPSON  
209 Madison Street  
Suite 500  
Alexandria, VA 22314

EXAMINER
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BRUTUS, JOEL F

ART UNIT	PAPER NUMBER
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3768

NOTIFICATION DATE	DELIVERY MODE
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10/06/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DocketingDept@young-thompson.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/587,490	<b>Applicant(s)</b> JOHANSSON ET AL.	
	<b>Examiner</b> JOEL F. BRUTUS	<b>Art Unit</b> 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-6, 9-14, 18 and 25-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9, 11-14, 18-10 and 25-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4-6, 8-11, 13-16 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cane et al (Pub. No.: US 2001/0056237) in view of Pastoureau et al (Quantitative assessment of articular cartilage and subchondral bone histology in the meniscectomized guinea pig model of osteoarthritis, 2003).

Regarding claims 1, 4, 10 and 31, Cane et al teach an apparatus comprises a light source for projecting light to illuminate an area a tissue sample; a photo-receptor (light detector, emphasis added) for receiving light remitted (backscattered, emphasis added) by the illuminated area of tissue, and a spectroscopic analyzer for monitoring the remitted light [see 0034]. Cane et al teach a comparator for comparing variations in the intensity and spectral characteristics of the remitted light with respect to the intensity and spectral characteristics of the projected light at different wavelengths and with data representing a datum sample of intensity and spectral characteristics of light and a signal emitter for emitting a control signal in response to any such variations [see 0032-0034].

Cane et al teach a probe with an extension arranged therein two bundles of optical fibers 4 and 5 [see fig 14 and 0188]; disclose the light is passed to a bundle of

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optical fibers 4 through which it is transmitted to the tissue and further teach the optical fibers 4, 5 run along an endoscope appropriate for the in vivo examination of internal epithelial tissue [see 0188]. Cane et al teach comparator 7 processes the intensity of lights backscattered from the tissue at different wavelengths and supplies the results to a processor 8 and to a display 9 or printer 10 [see fig 14]. Cane et al teach comparing the measured intensity of backscattered light from the tissue with a reference range for healthy tissue having a layered structure of a predetermined thickness [see 0019-0020] and based on the variation as indicated above determine the tissue thickness of the tissue (emphasis added).

Cane et al teach measuring means for measuring remitted red or infrared radiation from at least one location over said area of skin so as to give an indication of the collagen thickness in said area [see 0038]. Although Cane et al invention is used primarily to measure dermis layers of skin; Cane et al mention determining thickness of collagen rich layer [see 0021] and point out thickness of dermis over a joint will tend to be greater [see 0010].

Cartilage is a flexible connective tissue found in many areas in the body mainly joints between bones. Cartilage is composed primarily of collagen fibers. Therefore, Cane et al invention would be able to determine cartilage thickness based on intensities of backscattered light from the tissue at different wavelengths as claimed (emphasis added).

Cane et al don't teach measuring cartilage thickness based on optical properties of subchondral bone and cartilage.

However, Pastoureau et al disclose measuring cartilage thickness based on optical properties of subchondral bone and cartilage [see page 414].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Cane et al with Pastoureau et al by measuring cartilage thickness based on optical properties of cartilage and subchondral bone as disclosed by Pastoureau; in order to diagnose joint disease with great accuracy and higher precision.

Regarding claims 5 and 9, Cane et al teach means for monitoring intensity of light remitted with two dimensional array [see 0150].

Regarding claims 6, 8, 11, Cane et al disclose means for projecting UV and/or visible and/or red and/or infrared radiation onto an area of skin under investigation [see 0037] and white light [see 0197]. Cane et al teach a filter wheel 2 on fig 14 which contains a number of holes 21- 26 and each of which may be brought into light path and left at least one hole empty to allow light from source 1 to pass [see 0185]. The filter wheel can block the reference and measured light and only allow white light through (emphasis added).

Regarding claims 13-16 and 32-36 and 38, Cane et al teach wavelength range of 694 nm to 940 nm [see 0194] and near infrared region [see 0141, 0031, 0042].

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Regarding claims 37 and 39, Cane et al disclose wavelength corresponding to oxy-hemoglobin [see 0129, 0141] and use a variable wavelength laser [see 0134].

3. Claims 7 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Cane et al (Pub. No.: US 2001/0056237) in view of in view of Pastoureau et al (Quantitative assessment of articular cartilage and subchondral bone histology in the meniscectomized guinea pig model of osteoarthritis, 2003) as applied to claim 1 above and further Kaneko et al (US Pat: 5,305,759).

Regarding claims 7 and 12, Cane et al don't teach multiplexing.

However, Kaneko et al teach multiplexing reflecting lights [see column 35 lines 30-40].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Cane et al with Kaneko et al by using multiplexing; for the purpose of allowing multiple analog message signals or digital data streams to be combined into one signal over a shared medium; to reduce cost by sharing an expensive resource.

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 1, 4-16 and 31-35 have been considered but are moot in view of the new ground(s) of rejection. The 112 and 101 rejections of the previous office action are moot due to the amendment of the claims.

Applicant argues that Cane et al don't teach measuring cartilage thickness and further mentions that Cane et al only measure skin color.

The examiner disagrees because Cane et al teach measuring means for measuring remitted red or infrared radiation from at least one location over said area of skin so as to give an indication of the collagen thickness in said area [see 0038]. Although Cane et al invention is used primarily to measure dermis layers of skin; Cane et al mention determining thickness of collagen rich layer [see 0021] and point out thickness of dermis over a joint will tend to be greater [see 0010].

Cartilage is a flexible connective tissue found in many areas in the body mainly joints between bones. Cartilage is composed primarily of collagen fibers. Therefore, Cane et al invention would be able to determine cartilage thickness based on intensities of backscattered light from the tissue at different wavelengths as claimed (emphasis added).

Applicant argues that Cane et al don't teach measuring intensity of light from cartilage and subchondral bone to measure cartilage thickness.

The examiner agrees and relies on the teaching of the newly cited reference Pastaureau et al for these limitations.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL F. BRUTUS whose telephone number is (571)270-3847. The examiner can normally be reached on Mon-Fri 7:30 AM to 5:00 PM (Off alternative Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. F. B./  
Examiner, Art Unit 3768

/Long V Le/  
Supervisory Patent Examiner, Art Unit 3768